MYSIDACEA FROM THE CENTRAL AND WESTERN PACIFIC III. GENERA *EOERYTHROPS, HOLMESIELLA, PTEROMYSIS, LONGITHORAX* AND *KATERYTHROPS* (TRIBE ERYTHROPINI)

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With Text-figures 1–13 and Plate I

Genus *Eoerythrops* Murano 1969

Characteristics of the Genus

1. Carapace produced anteriorly into a tongue-shaped rostrum.
2. Eye large, globular and functionally normal.
3. Antennal peduncle short, consisting of 3 subequal segments.
4. Antennal scale long, with outer margin terminating into a large spinous process which is subequal to apex in length.
5. Telson elongate-triangular or elongate-linguiform, armed on apex with a pair of plumose setae; margin of telson armed on its distal 1/2 to 2/5 with spines which increase length posteriorly.
6. Pseudobranchial processes on endopods of male pleopods slender.

Remarks

The present genus was created by the present author in 1969 for the reception of *E. typicus* from Japan. It is very closely related with the genus *Metamblyops*, and the difference from the latter genus is only found in one character, the presence of a pair of apical plumose setae on the telson. The present genus is also allied to *Gibberythrops* and *Holmesiella*, but it differs from *Gibberythrops* in the shape and armature of the telson and from *Holmesiella* in the structure of the fourth pleopod of male, respectively.

Only two species, including the present new species described here, are known.

Key for the identification of the species in the genus *Eoerythrops*

1. Antennal scale nearly 5 times as long as broad; external margin nearly straight. Telson elongate-triangular, armed with spines on distal half of lateral margin. ..... *E. typicus* Murano (Central Japan)
– Antennal scale about 6 times as long as broad; external margin curved outwardly. Telson elongate-linguiform, armed with spines on distal 2/5 of lateral margin. ..... *E. amamiensis* sp. nov. (South-western Japan)

Publ. Seto Mar. Biol. Lab., XXIII (1/2), 19–50, 1976. (Article 2)

Eoerythrops typicus Murano 1969

Eoerythrops typicus Murano, 1969: 210–211; 1970: 140–141.

Occurrence:

St. 3–3, 1 adult male (12.0 mm) and 1 near-adult female (9.6 mm).
St. 15, 1 near-adult female (9.6 mm).
St. 221–5, 1 adult male (10.7 mm).
St. 293–2, 1 adult male (11.0 mm) and 1 immature female (8.2 mm).
St. 341, 1 immature male (12.2 mm), 3 immature females (10.4, 9.4 and 9.0 mm) and 1 young form (6.0 mm).

Eoerythrops amamiensis sp. nov.

(Figs. 1 and 2)

Occurrence:

St. 440, 10 adult males (5.5 to 6.1 mm) and 1 near-adult female (5.1 mm).

Description:

Body rather robust; a constriction between thorax and abdomen present (Fig. 1,

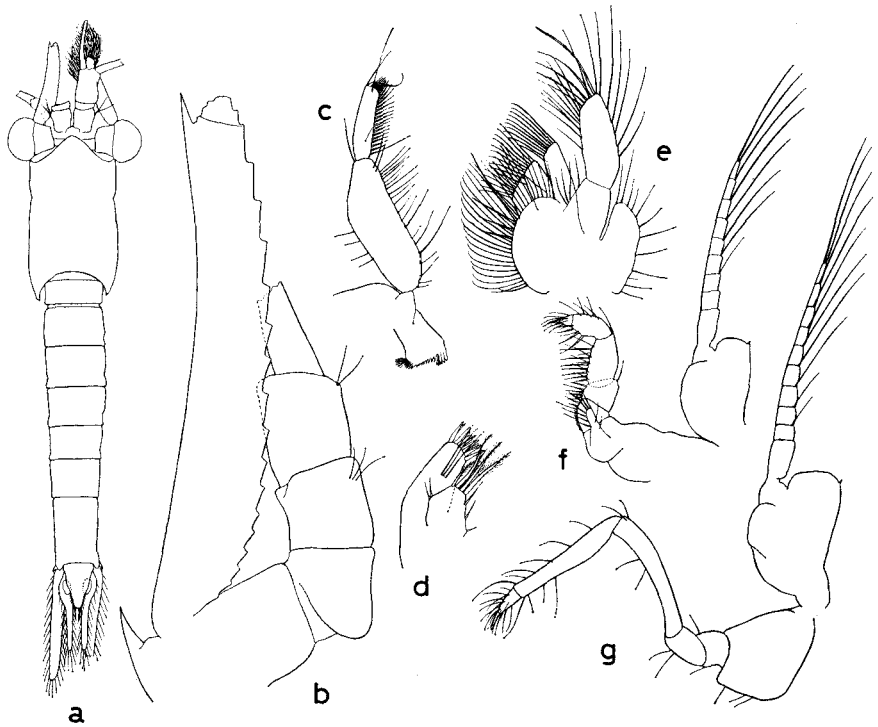

Fig. 1. *Eoerythrops amamiensis* sp. nov.; a, adult male in dorsal view, ×10; b, antennal scale and peduncle, ×67; c, mandible, ×32; d, maxillule, ×67; e, maxilla, ×67; f, first thoracic limb, ×32; g, second thoracic limb, ×32.

a). Carapace short, not reaching to base of antennular peduncle, emarginate posteriorly, leaving the ultimate and half of the penultimate thoracic somites uncovered in dorsal view; anterior margin of carapace produced into a triangular rostral plate with rounded tip; antero-lateral corner produced in dorsal view; cervical sulcus well marked (Fig. 1, a). Antennular peduncle somewhat robust in male than in female; first segment slightly longer than width, outer distal corner not produced, armed with a few setae; second segment short, 1/3 of first segment in length, third segment longest, longer than preceding 2 segments combined, 1.5 times as long as broad (Fig. 1, a). Antennal peduncle short, composed of 3 segments which are almost of the same length

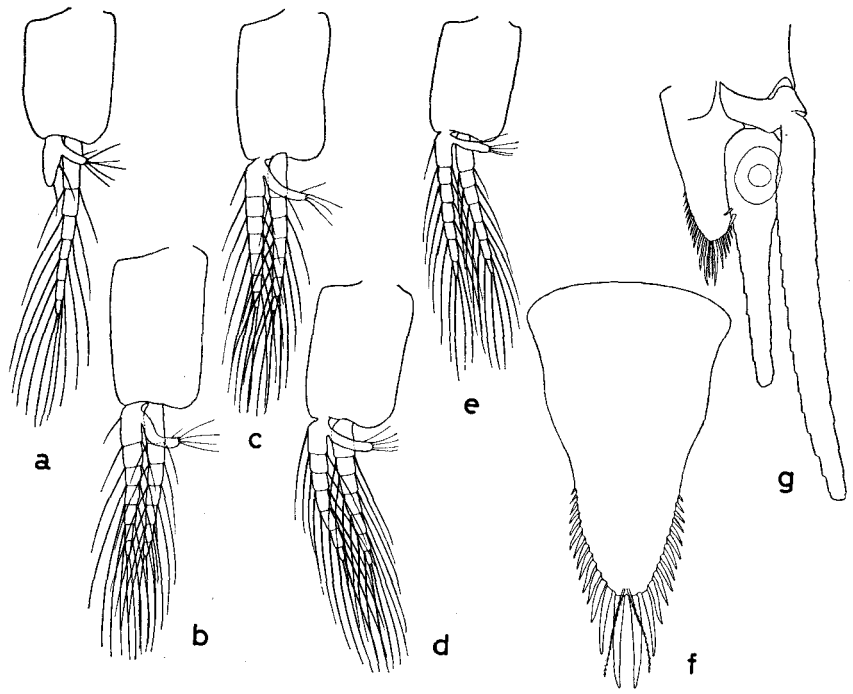

Fig. 2. *Eoerythrops amamiensis* sp. nov.; a, first pleopod of male, ×32, b, second pleopod of male, ×32; c, third pleopod of male, ×32; d, fourth pleopod of male, ×32; e, fifth pleopod of male, ×32; f, telson, ×67; g, telson and uropod, ×32.

(Fig. 1, b). Antennal scale very long and narrow, about 6 times as long as broad, more than twice as long as antennal peduncle, extending beyond distal margin of antennular peduncle by distal 1/4 of the scale; external margin concave and naked, terminating into a strong spinous process which is slightly longer than the apex of the scale; distal suture present (Fig. 1, b). Mouth parts and first and second thoracic endopods allied to those of *E. typicus* (Fig. 1, c, d, e, f and g). Abdomen composed of 6 segments; first 5 segments subequal; sixth segment longest, somewhat shorter than twice as long as preceding one, about 1.5 times as long as broad (Fig. 1, a). Pleopods

of male developed, natatory and biramous; first pair with a short unsegmented endopod and 7-segmented exopod; second to fifth pairs subequal, with 7-segmented endopod and exopod which are the same in length; pseudobranchial process on endopod of male pleopod long and narrow (Fig. 2, a, b, c, d and e). Telson elongate-linguiform, about 2/3 of the last abdominal somite in length, 1.5 times as long as broad at base; lateral margin furnished on distal 2/5 with spines which become progressively longer posteriorly; basal naked part of lateral margin convex at its middle portion; terminal pair of spines long and stout, curved inwardly, about 2/7 of length of telson; a pair of plumose setae present (Fig. 2, f). Uropod slender; exopod somewhat curved outwardly, about 2.5 times as long as telson; endopod 2/3 of exopod in length, furnished with 2 or 3 small spines on ventral side near inner margin at statocyst region (Fig. 2, g).

Types:

Holotype, adult male of 5.9 mm; allotype, near-adult female of 5.1 mm; 9 paratypes; all types from St. 440.

Remarks:

It was judged that the present species belongs to the genus *Eoerythrops* from characteristics such as the long antennal scale, the slender pseudobranchial process on endopod of male pleopod, and the armature on the telson. However, there is room for further study since this species differs from the other species of the genus, *E. typicus*, in two important characteristics, namely, the presence of a constriction between thorax and abdomen and the absence of the spinous process at the outer distal corner of sympod of antenna.

In addition to the above two characteristics, there are found the following differences from *Eoerythrops typicus*: 1) In the present species the carapace leaves the basal part of antennular peduncle exposed, whereas in *E. typicus* it covers the basal part. 2) In the present species the antennal scale is curving outwardly and is 6 times as long as broad, while in *E. typicus* it is almost straight and is nearly 5 times as long as broad. 3) In the present species the telson is elongate-linguiform and armed with spines on distal 2/5 of the margin, while in *E. tyicus* it is elongate-triangular and armed with spines on distal half. 4) Endopod of uropod is armed with 2 or 3 spines on ventral surface near inner margin at statocyst region in the present new species, but it is armed with 5 spines in *E. typicus*.

The species is named after the type locality, Amami Islands, south-western Japan.

The type specimens are lodged in Ocean Research Institute, University of Tokyo.

Genus *Holmesiella* Ortmann 1908

Characteristics of the Genus

1. Eye large, globular and functionally normal.

2. Antennal scale long and straight, extending forward beyond distal margin of antennular peduncle.

3. Telson elongate-triangular; apex narrowly truncate, armed with a pair of plumose setae and 2 pairs of spines, of which inner pair is much smaller than outer one; lateral margin armed on distal 1/2 to 2/3 with 12 to 18 regularly arranged spines which gradually increase length toward posterior end.

4. Endopod of fourth pleopod of male elongated, and terminating into a long and strong seta.

Remarks

Genus *Holmesiella* is easily distinguishable by the elongation of the endopod of fourth pleopod of male from the other genera of tribe Erythropini except genus *Pteromysis*. From *Pteromysis* it is clearly distinguished by the shapes of exopods of third to eighth thoracic limbs.

The genus is composed of two species, *H. anomala* and *H. affinis*. Both of these species have been only recorded from the North Pacific and they were obtained in the present collections.

Key for the identification of the species in the genus *Holmesiella*

1. Endopod of fourth pleopod of male extremely long, more than twice as long as exopod. Articulation between second and third segments of antennal peduncle of usual type in mysids. ..... *H. anomala* Ortmann (North Pacific)

– Endopod of fourth pleopod of male only a little longer than exopod and showing no remarkable elongation of distal joint. Third segment of antennal peduncle overhanging distal portion of second segment in dorsal view. ..... *H. affinis* Ii (Japan)

Holmesiella anomala Ortmann 1908

(Fig. 3)

Holmesiella anomala Ortmann, 1908: 6–7; Esterly, 1914: 14; W. Tattersall, 1933: 5–6; Banner, 1947: 395–399; W. Tattersall, 1951: 106–109; Banner, 1954: 580; Birstein and Tchindonova, 1958: 304–305; Ii, 1964: 347–348.

Occurrence:

St. 84–3, 2 immature females (22.5 and 14.4 mm) and 6 immature males (13.1 to 17.4 mm).

Remarks:

W. Tattersall (1951) described and figured that the growth changes, the increase in length of the distal joint of the endopod of fourth pleopod and the gradual increase in length of the setae of the whole pleopods and their change from simple setae to plumose setae, are observed in the male pleopod. In the present collections immature specimens were only collected, but the fourth pleopod of male in the present specimens completely coincide with Tattersall's description and the figures as shown in Fig. 3. There are no doubts that these specimens are identified with *H. anomala*.

Banner (1947) reported that the present species is distinguishable into two forms by the size at maturity, the large form and the small form. Individuals grow into

adulthood at 25 to 38 mm in the large form and at 15 to 20 mm in the small form. On the other hand, Tattersall (1951) distinguished from the difference in their habitats into two races, the deep-water race and the coastal race. Although the above authors used the different terms, the deep-water race corresponds to Banner's large form and the coastal race to Banner's small form, respectively. It seems that the present specimens belong to the large form or the deep-water race from the relation of the state of growth and the size of body.

Geographical distribution:

The present species has been recorded from the Pacific coasts of United States and Canada, off Alaska, Bering Sea, Okhotsk Sea and Japan Sea. The present record from Sagami Bay is the first record from the Pacific coast of Japan and is the southernmost record in the western North Pacific.

Vertical distribution:

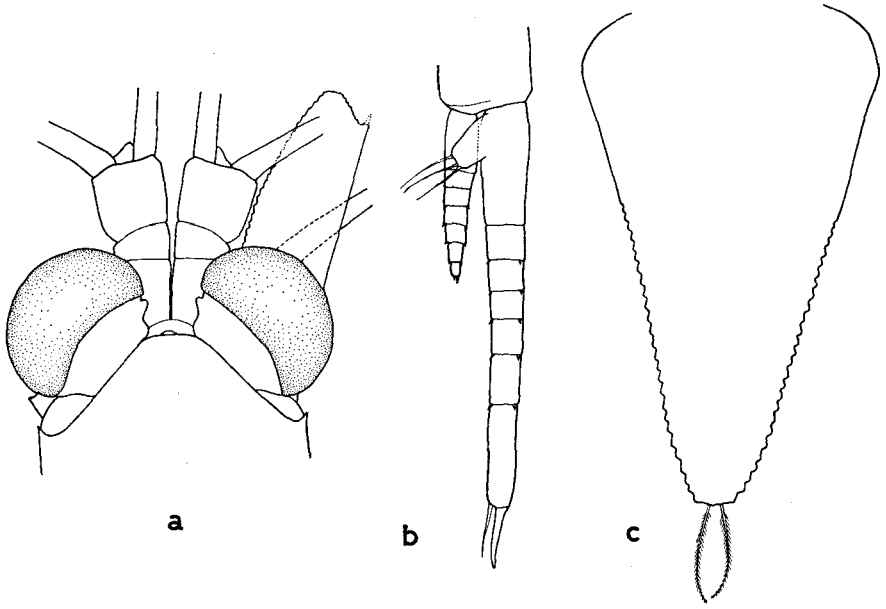

Fig. 3. *Holmesiella anomala* Ortmann; a, anterior end of immature male of 15.4 mm, ×13; b, fourth pleopod of immature male of 15.4 mm, ×32; c, telson, ×32.

According to Tattersall's examination (1951), the coastal race is found in the water of the western coast of North America from British Columbia to California at depths of about 180 m or so, and the deep-water race also has a similar geographical distribution, but at much deeper water. The species tends to get into deeper water in more southern latitudes. The average depth of the Alaskan stations was about 540 m, and that of the Californian stations about 830 m. The present specimens were collected from the sea floor at about 1000-m depth.

Holmesiella affinis Ii 1937

(Fig. 4)

Holmesiella affinis Ii, 1937: 200–205; 1964: 348–351; Murano, 1970a: 260; 1970b: 141.

Occurrence:

St. 221–5, 2 adult females with embryos in marsupium (21.0 mm with 23 embryos and 18.8 mm with 37 embryos), 2 adult males (15.8 and 14.9 mm), 3 immature females and 1 immature male.

St. 293–2, 3 adult females with embryos in marsupium (22.0, 21.8 and 18.0 mm), 3 adult males (16.9, 16.1 and 14.5 mm), 25 immature females and 13 immature males.

St. 341, 1 adult male (18 mm).

St. 392–1, 3 adult females (12 to 13.7 mm), 2 adult males (12 and 10.5 mm), 2 immature females and 2 immature males.

St. 557–1, 1 adult female with embryos in marsupium (23 mm), 3 adult males (17 to 19 mm) and 7 immature males.

St. 636, 4 adult females (13 to 14 mm) and 1 adult male (13 mm) and 3 immature males.

St. H33, 1 adult male (13.5 mm).

St. H36, 1 adult female with 18 embryos in marsupium (14 mm).

St. S1, 1 young form.

St. S2, 1 adult female with embryos in marsupium (12.4 mm), 4 adult males (12.5 to 11.6 mm) and 7 immature females, 2 immature males and 3 young forms.

St. S3, 6 adult females (2 of them, 13.0 and 13.5 mm), 3 immature females and 1 immature male.

Remarks:

The present species is easily distinguished from the other species of the genus, *H. anomala,* by the shapes of the fourth pleopod of male and by the articulation of the antennal peduncle. The remarkable elongation in the distal segment of the fourth endopod of the male pleopod as shown in *H. anomala* never occur at any stages of development in *H. affinis* (Fig. 4). The difference in the body size is partly useful for the distinction between these two species. However, there is an overlap in the body lengths between the large-sized form of *H. affinis* and the small-sized form of *H. anomala.*

It was reported by the present author that there are two races, the large-sized deep-water race and the small-sized shallow-water race (Murano, 1970b). In the present collections the large-sized deep-water race was collected from depths of 220 to 410 m, and the small-sized shallow-water race from depths of 76 to 185 m. Their body lengths were 18 to 23 mm in adult female and 14.5 to 19 mm in adult male of the former race, and 12 to 14 mm in adult female and 10.5 to 13.5 mm in adult male of the latter race, respectively. It seems that both the races have drawn a boundary

at the depth of about 200 m.

The type specimens from East China Sea described by Ii were identified with the small-sized shallow-water race by the size of body and by the shapes of rostrum and telson, though Ii did not give the depth at which his specimens were taken.

Geographical distribution:

The present species has been only recorded from the adjacent waters of Japan. It seems that the species tends to be distributed in more southern areas as compared with *H. anomala*.

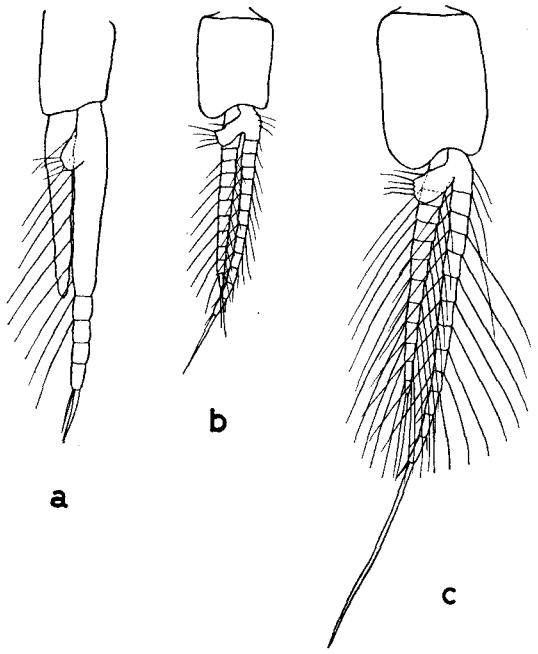

Fig. 4. *Holmesiella affinis* Ii; a series of fourth pleopod of male of large-sized deep-water race: a, 13.7 mm, ×40; b, 14.5 mm, ×16; c, 16.8 mm, ×16.

Vertical distribution:

The small-sized shallow-water race is distributed in depths of 70 to 200 m and the large-sized deep-water race in depths of 200 to 400 m.

Genus *Pteromysis* Ii 1964

Characteristics of the Genus

1. Eye well developed, globular, functionally normal.
2. Rostral plate broadly triangular with rounded apex.
3. Antennal scale long and straight, extending beyond distal margin of antennular peduncle by about 1/4 of its length.

4. Antennal peduncle with third segment overhanging distal portion of second segment in dorsal view.

5. Endopod of third to eighth thoracic limbs with merus broadened into a thin leaf-like plate.

6. Telson elongate-triangular; apex narrowly truncate, armed with a pair of apical spines and a pair of median spinules; a pair of plumose setae present; lateral margin armed on distal half with about 11 spines.

7. Endopod of fourth pleopod of male elongated, terminating into a long and strong seta.

Remarks

In 1964 the present genus was instituted by Ii for the reception of a single female of about 9-mm length. Although his specimen had no oostegites on the thoracic limbs, he suggested that the specimen is probably an adult female because the curious thoracic limbs, extremely broadened merus of third to eighth endopods, may be a compensation for the loss of oostegites. In 1970 Murano made clear through the collection of an adult female with well developed oostegites that Ii's specimen was an immature female of which oostegites did not appear at all.

The present author was given a chance of examination on an adult male collected from Uraga Channel, mouth of Tokyo Bay, through the favor of Mr. H. Suzuki, Tokai Regional Fisheries Research Laboratory. Fourth pleopod of male is very closely allied to that of *Holmesiella* by the elongation of a few distal segments and by a long terminal seta on the endopod. The similarity with the genus *Holmesiella* was not only observed in the fourth pleopod of male but also in the antennal scale, antennal peduncle and telson. Now, the difference only remains in endopods of third to eighth thoracic limbs.

The genus holds only one species, *P. amemiyai.*

Pteromysis amemiyai Ii 1964

(Fig. 5 and Pl. I)

Pteromysis amemiyai Ii, 1964: 357–360; Murano, 1970: 141–142.

Occurrence:

St. 108, 1 immature female (ca. 8.5 mm).

St. 151, 2 immature females (11.6 and 6.9 mm).

St. 154, 1 immature female (10.2 mm).

St. 202, 2 adult (15.5 mm and anterior half of body) and 7 immature (13.9 to 5.7 mm) females.

St. 293–3, 1 immature female (7.6 mm).

Specimen No. E–1, 1 immature female (12.0 mm); collection data unknown.

Specimen No. E–2, 1 adult male (16.7 mm); Oct. 18, 1973, Uraga Channel, 350–400 m, mid-water trawl.

Remarks:

Description of the male pleopod is given below: Male pleopods biramous and

natatory; endopod of fourth pair elongated and extending beyond the tip of exopod by 3 distal segments of endopod; outer one of 2 terminal setae on endopod very long and stout, equal to exopod in length, densely furnished with very short setae on lateral margins of its distal half except a short distance near tip; the other seta reduced to short and slender hair.

Coloration in shown in Pl. I.

Geographical distribution:

The present species is only known from Sagami and Suruga Bays and Uraga Channel, Central Japan.

Vertical distribution:

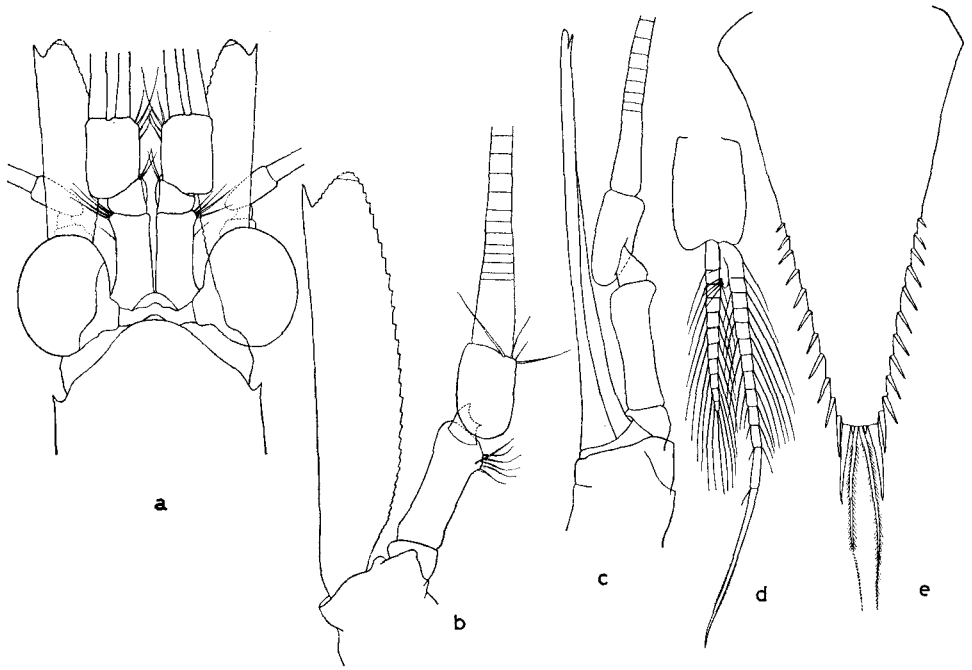

Fig. 5. *Pteromysis amemiyai* Ii; a, anterior end of adult female, ×11; b, antennal scale and peduncle in dorsal view, ×22; c, antennal scale and peduncle in lateral view, ×22; d, fourth pleopod of male, ×11; e, telson, ×28.

The type specimen and the present ones from Sts. 108, 151 and 154 were obtained by an opening net, so that it is impossible to know the exact depths at which they were collected. While the specimens from St. 202 were taken from the bottom of 480 m when the net accidentally came in touch with the bottom in an oblique haul. The specimen from St. 293–3 was collected from the bottom at depth of 370 to 430 m by the bottom-net. An adult male was taken from mid-layer of 350 to 400 m deep where the depth was about 450 m. It seems that the species lives keeping some contacts with the sea floor at the depth of 350 to 500 m.

Genus *Longithorax* Illig 1906

Characteristics of the Genus

1. Last thoracic somite extremely long, occupying about 1/3 of cephalothorax.
2. Carapace small, covering only 1/2 to 2/3 of cephalothorax, leaving prolonged last thoracic somite exposed.
3. Eye normal or somewhat reduced, with a finger-like process on eyestalk.
4. Telson triangular, armed with spines on apex and on distal portion of lateral margin.

Remarks

The present genus is distinguishable from other mysids by the prolongation of the last thoracic somite.

Up to now, five species are known as follows: *L. similerythrops* Illig, *L. fuscus* Hansen, *L. capensis* Zimmer, *L. alicei* Nouvel and *L. nouveli* O. Tattersall. In the present collections two species were taken.

Key for the identification of the species in the genus *Longithorax*

1. Telson armed with 1 or 2 pairs of spines on apex and with 4 to 7 spines on each lateral margin. ..... *L. fuscus Hansen* (North and Equatorial Atlantic; West Pacific)
- Telson armed with 1 or 2 pairs of spines on apex and unarmed or armed with 1 spine on each lateral margin. 2
2. Eye large, depressed dorso-ventrally; cornea more or less rectangular in lateral view; eyestalk conical, narrower than cornea. ..... *L. alicei* Nouvel (Canary Is.)
– Eye small, not depressed dorso-ventrally; eyestalk not narrower than cornea. 3
3. Telson armed with 2 pairs of small spines on narrow apex; lateral margin unarmed ..... *L. similerythrops* Illig (Off Somalia and Maldive Is.)
– Telson armed with a pair of small spines on narrow apex and with 1 spine on each lateral margin. 4
4. Anterior margins of rostral plate converging into a right angle and produced forward between eyes as a bluntly rounded rostrum; antennal scale less than 3 times as long as broad; size being 9 to 10 mm in adult male and 8 to 9 mm in adult female ..... *L. capensis* Zimmer (Off South Africa, off Somalia and off Cape Verde)
- Rostral plate converging into an obtuse angle and not produced forward between eyes as a bluntly rounded rostrum; antennal scale more than 3 times as long as broad; size being 13 mm in adult female. ..... *L. nouveli* O. Tattersall (Azores, Bermuda and Equatorial Mid-Pacific)

Longithorax fuscus Hansen 1908

(Fig. 6 and Pl. I)

Longithorax fuscus Hansen, 1908: 103–105; Zimmer, 1909: 124–126; W. Tattersall, 1911: 52–53; Stephensen, 1912: 79; Nouvel, 1943: 74–75; W. Tattersall and O. Tattersall, 1951, 270–273; Birstein and Tchindonova, 1958: 329–330; O. Tattersall, 1961: 153–154.

Xenerythrops lobifera Ii, 1964: 302–305.

Occurrence:

St. 79, 1 immature male (16.0 mm).
St. 117–2, 1 adult female (22.8 mm).
St. 121–2, 2 immature females (ca. 16.0 and 11.5 mm).
St. 144–3, 1 adult female (22.5 mm).
St. 145–3, 1 adult female (ca. 22.6 mm).
St. 150, 1 immature female (12.9 mm).
St. 157, 1 adult male (22.2 mm).
St. 169–4, 1 adult female (21.4 mm).
St. 177–5, 1 immature female (12.5 mm).
St. 197–1, 1 immature female (10.4 mm).
St. 223–6, 1 immature female (9.5 mm).
St. 228, 2 immature females (13.5 and 9.5 mm).
St. H160–13, 1 immature female (12.7 mm).

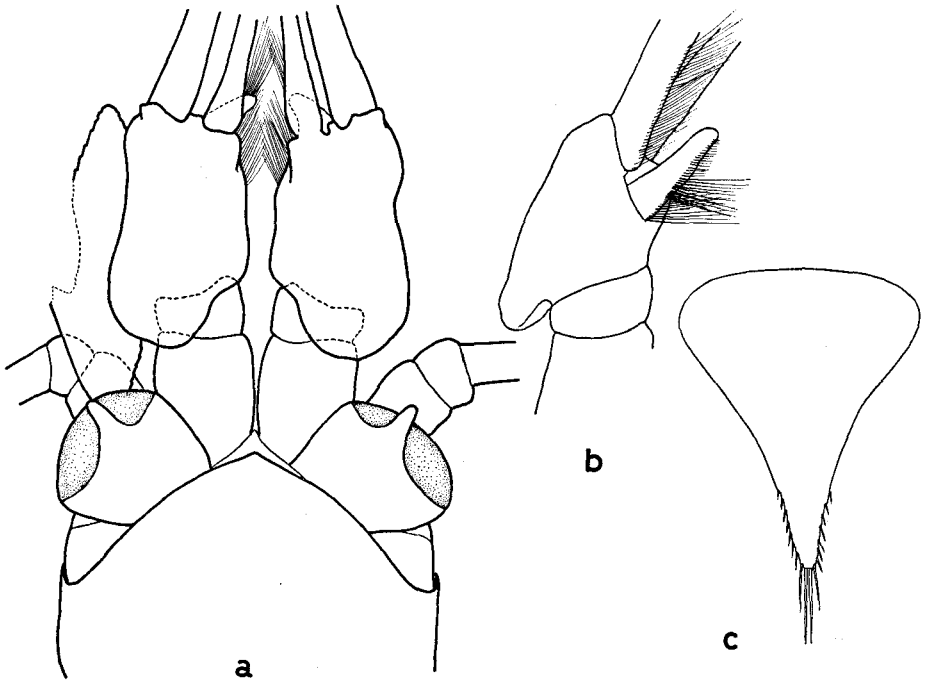

Fig. 6. *Longithorax fuscus* Hansen; a, anterior end of adult male, ×17; b, antennular peduncle of adult male in lateral view, ×17; c, telson, ×34.

Remarks:

The present species is readily distinguishable from other species of the genus by the telson furnished with 4 to 8 spines on each lateral margin.

Until now, a full view of the antennular peduncle was not given since the third segment of the peduncle probably was easily broken off, but fortunately, it was given by an adult male in this collections. The antennular peduncle is almost of the same

level with the antennal scale. Its third segment is very large and much longer than the preceding two segments combined in dorsal view; the proximal portion of the third segment is overhanging the second segment and extends backward beyond the anterior margin of the first segment (Fig. 6, a and b).

In 1964 Ii established *Xenerythrops lobifera* for the reception of a single badly damaged specimen 10 mm long, collected from Sagami Bay. He did not find out the prolongation in the last thoracic somite, one of the most valuable character, because of the heavy injury of his specimen. Judging from his description and figure, however, it is sure that *X. lobifera* is a synonym with *L. fuscus*.

W. Tattersall (1911) and W. Tattersall and O. Tattersall (1951) were of the opinion that the present species is a synonym with *L. similerythrops* recorded by Illig in 1906 because there are no differences between *L. fuscus* and *L. similerythrops* except the armature of the telson, and the difference in the telson may be ascribed to the change accompanied with the growth. It seems, however, that these two species can not be amalgamated by reason of the following characteristics in *L. similerythrops*: 1) Eye is relatively small; 2) rostral plate converges into an acute angle; 3) antennal scale is much shorter than antennular peduncle, and its terminal lobe is 1/5 of the total length of the scale; and 4) a small marsupium is visible in immature female 7 mm long (which is in *L. fuscus* barely visible for a female 12.7 mm long). On the contrary, the characteristics mentioned above seem to show the similarity among the forms of *L. capensis* group.

The number of the lateral spines of the telson was examined for the present specimens. The result is shown in Table 1.

Table 1. The change in the number of lateral spines of the telson of *Longithorax fuscus* Hansen with growth.

Body length (mm)		<10	10–15	15–20	20–25
Number of specimens observed		2	6	1	3
Number of lateral spines	range	3	3–5	4	4–7
	average	3	3.5	4	5.3

The coloration of this species was reported by Nouvel (1943) to be brownish black. Among the present specimens, one from St. 169–4 showed the coloration of real black when the specimen was just collected from the sea, but it changed little by little to dark green in progress of time under preservation in the neutralized 5% formalin sea-water (Pl. I).

Geographical distribution:

The present species has been recorded from the Atlantic Ocean (south of Iceland, south-west of Ireland, south of Greenland, off Ghana and the Bay of Biscay) and the Pacific Ocean (off Japan). The species appears to be a cosmopolitan, but it has not been recorded from the East Pacific and the Indian Oceans.

Vertical distribution:

Records of the horizontal hauls by the ORI-net with an opening-closing device indicate that the species is a bathypelagic form inhabiting deeper waters of 700- to 1000-m layers.

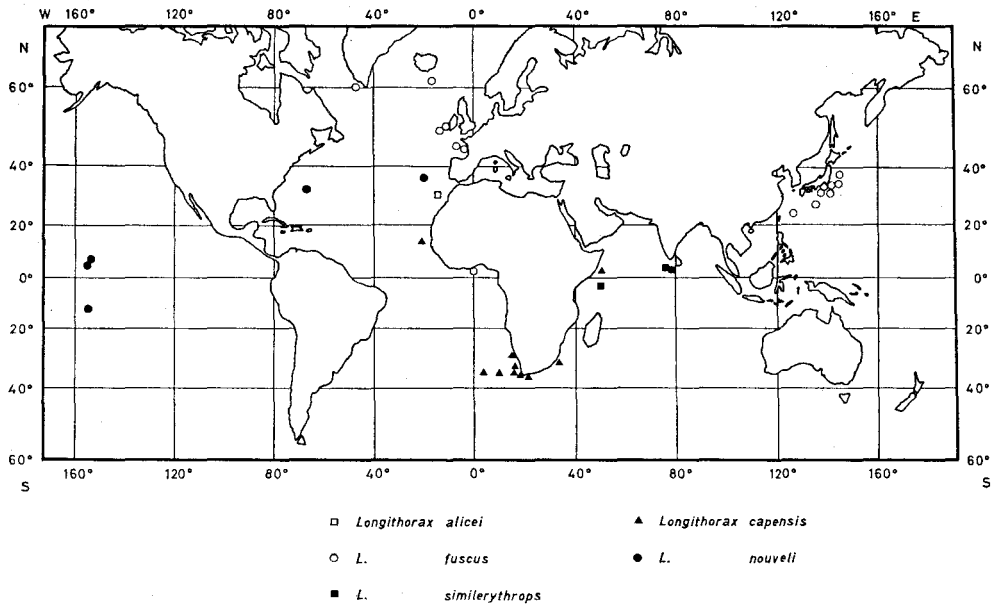

Fig. 7. Geographical distribution of five species belonging to the genus *Longithorax*.

Longithorax nouveli O. Tattersall 1955

(Fig. 8)

Longithorax nouveli O. Tattersall, 1955: 126–127.
Longithorax capensis Nouvel, 1943: 75–76; W. Tattersall, 1951: 120–121; Banner, 1954: 581.

Occurrence:

St. H113–4, 1 immature female with small marsupium (9.4 mm).
St. H113–6, 1 adult female (ca. 10 mm) and 1 immature male (7.6 mm).
St. H123–6, 1 adult male (ca. 10.2 mm).

Remarks:

In 1955, O. Tattersall created a new species *L. nouveli* for the reception of the specimens which have been already recorded under the specific name of *L. capensis* from Azores by Nouvel (1943) and from Bermuda by W. Tattersall (1951). Differences from *L. capensis* mentioned by O. Tattersall are shown in Table 2.

The specimen from St. H113–4 is in the good condition and this bears characteristics as follows: 1) Anterior margin of rostral plate are not straight and not produced forward between eyes as a bluntly rounded rostrum as in *L. capensis* (Fig. 8, a); 2) antennal scale is about 3.5 times as long as broad (Fig. 8, b); 3) no spines are

Table 2. Morphological differences between *Longithorax nouveli* O. Tattersall and *L. capensis* Zimmer.

	Longithorax nouveli	*Longithorax capensis*
Anterior margin of rostral plate	Straight and converging into an obtuse angle (about 120°), and not produced forward between eyes as a bluntly rounded rostrum.	Not straight, converging into a right angle, and produced forward between eyes as a bluntly rounded rostrum.
Antennal scale	Length: greatest width=>3: 1	Length: greatest width=2.7: 1
Uropod	Unarmed with spines.	Armed with 1 spine.
Size	Large, reaching to 13 mm in adult female.	Small, 9 to 10 mm in adult male and female.

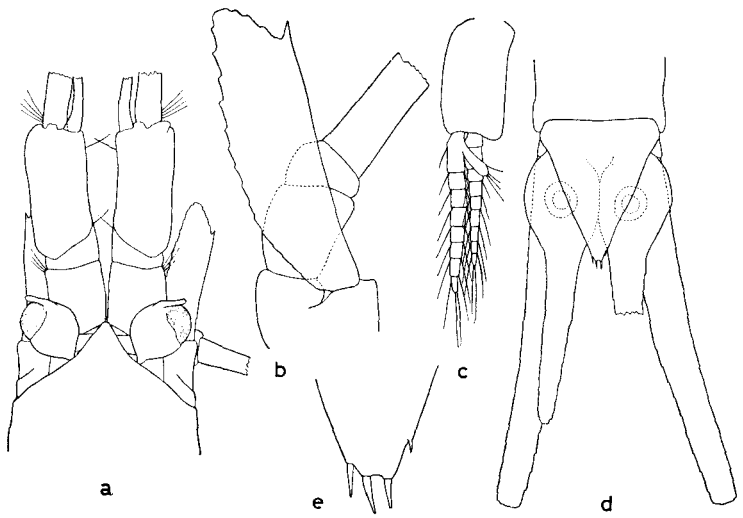

Fig. 8. *Longithorax nouveli* O. Tattersall; a, anterior end of immature female, ×27; b, antennal scale and peduncle, ×54; c, fourth pleopod of male, ×27; d, posterior end of immature female, ×27; e, distal end of telson, ×106.

present near the statocyst on inner margin of the endopod of uropod (Fig. 8, d); 4) the present material of 9.4 mm is an immature female with very small oostegites.

Although there is a small difference in the shape of the anterior margin of the rostral plate, the characteristics mentioned above support that the present specimens are identified with *L. nouveli*.

Adult specimens from Sts. H113–6 and H123–6 are in bad condition but they are estimated at 10 mm in female and 10.2 mm in male in the body length, respectively. They are too small as compared with the W. Tattersall's specimen which was 13 mm long. The difference from the Atlantic specimens is also present in this

point.

The present specimens are allied to a specimen, which is a young form 4.0 mm long, identified with *L. similerythrops* by Pillai from the tropical Indian Ocean. The differences, however, are present in the shape of rostrum and the structure of eye.

Geographical distribution:

In the past the species has been only recorded from the North Atlantic Ocean near Azores and Bermuda. Therefore, the present occurrence from near Tahiti Island and Christmas Island is the first record from the Pacific Ocean.

Vertical distribution:

The present specimens were obtained by the ORI-net with an opening-closing device from the depths of 610 to 770 m, 750 to 800 m and 620 to 870 m. It seems that the species is a bathypelagic form living in the layer of about 700 m deep.

Genus *Katerythrops* Holt and W. Tattersall 1905

Characteristics of the Genus

1. Carapace much wider than abdomen; cervical region much inflated and separated from thoracic region by a deep sulcus.
2. Antennal scale narrow, curved slightly outward.
3. Telson triangular; lateral margin naked; distal margin very narrow, armed with 2 pairs of spines.

Remarks

The present genus is the most closely related to the genus *Heteroerythrops* in the small antennal scale and triangular telson with naked lateral margin. The former genus is, however, distinguishable from the latter in the following respects: 1) In *Katerythrops* the antennal scale is furnished with a strong spinous process which terminates the naked outer margin of the scale, while in *Heteroerythrops* any kind of spinous process is not present; 2) in the former genus the telson is only armed with spines on apex, while in the latter it is armed on apex with one or two plumose setae in addition to spines.

The present genus is rather easily distinguishable from other allied genera by the characteristics of the marked inflation of cephalic region of carapace and of the shape and armature of telson.

Small antennal scale and small eye have been mentioned as valuable characters of the genus. In *K. tattersalli,* however, the scale is rather long and extending forward beyond the distal end of the antennular peduncle, so that the small antennal scale is not recognized as a generic character. The small eye is also a remarkable character in *K. oceanae,* but it must be reversed from the characters of the genus by the finding of *K. resimora* of which the cornea is wider than eyestalk.

Until now, five species are referred to the present genus as follows: *K. oceanae* Holt and W. Tattersall, *K. dactylops* Illig, *K. parva* Zimmer, *K. tattersalli* Illig and *K. resimora* O. Tattersall. Out of these five species *K. dactylops* was united into *K. oceanae* by Illig (1930), and *K. parva* was transferred to the genus *Teraterythrops* by the present

author as discussed in his preceding paper (1975). Then, this genus is composed of three species. Only one species, *K. oceanae*, was caught in the present collections.

Key for the identification of the species in the genus *Katerythrops*

1. Antennal scale long, extending beyond distal end of antennular peduncle ... *K. tattersalli* Illig (East of Dar es Salam, east coast of Africa)
– Antennal scale short, not extending to distal end of antennular peduncle. 2
2. Cornea narrower than eyestalk. ..... *K. oceanae* Holt and W. Tattersall (Atlantic and Indian Oceans; Pacific Ocean off Japan)
– Cornea wider than eyestalk. ..... *K. resimora* O. Tattersall (West of Cape Town)

Katerythrops oceanae Holt and W. Tattersall 1905

Katerythrops oceanae Holt and W. Tattersall, 1905: 117–119, 143; Hansen, 1905: 7; Holt and W. Tattersall, 1905: 7–9; 1906: 24; Zimmer, 1909: 93–95; W. Tattersall, 1911: 30; 1926: 10; Illig, 1930: 432–433; Nouvel, 1943: 77–78; W. Tattersall, 1951: 118; W. Tattersall and O. Tattersall, 1951: 214–217; O. Tattersall, 1955: 118–119; Ii, 1964: 307–312.
Katerythrops dactylops Illig, 1906: 198–199.

Occurrence:

St. 3–3, 1 adult female.
St. 6–1, 1 adult male.
St. 6–5, 1 adult male.
St. 6–6, 1 immature male.
St. 8, 1 adult female.
St. 14, 1 immature male.
St. 60–2, 1 young form.
St. 66–1, 1 immature male.
St. 66–7, 1 adult male.
St. 94, 1 immature female and 1 adult male.
St. 98, 1 adult male.
St. 104–8, 1 adult female.
St. 106–1, 1 adult female.
St. 107, 1 adult female.
St. 108, 1 adult female.
St. 109, 2 adult females.
St. 110, 1 adult male.
St. 111–1, 1 adult female.
St. 111–2, 1 adult male.
St. 112, 1 adult female and 2 adult males.
St. 113, 1 adult female.
St. 114, 1 adult female and 1 adult male.
St. 117–1, 2 adult males.
St. 117–2, 1 adult and 1 immature females.
St. 132, 1 adult female.
St. 134, 1 immature female.
St. 138, 1 immature female and 1 adult male.
St. 141–1, 1 immature female.
St. 144–1, 1 adult and 1 immature females.
St. 144–2, 1 adult female.
St. 144–3, 1 adult female.
St. 145–1, 1 adult female.
St. 145–2, 1 adult female.
St. 146–3, 1 adult female.
St. 149–2, 1 immature female.
St. 150, 1 adult female and 1 adult male.
St. 156–1, 1 adult female and 1 adult male.
St. 157, 1 adult female.
St. 159, 1 adult male.
St. 161, 1 adult female.
St. 169–3, 2 immature females.
St. 176–4, 1 immature male.

St. 176–5, 1 adult female.
St. 176–6, 1 adult male.
St. 178–5, 1 adult female.
St. 179–4, 1 adult male.
St. 180–4, 1 adult male.
St. 184–4, 1 immature female.
St. 185, 1 adult male.
St. 190–3, 2 adult females.
St. 190–7, 1 adult male.
St. 191–1, 1 adult female.
St. 193, 1 adult female.
St. 196–2, 1 adult male.
St. 198–1, 1 adult female.
St. 212, 2 adult females and 1 adult male.
St. 220, 1 adult female and 2 adult males.
St. 222–10, 1 adult female.
St. 224–5, 1 adult male.
St. 224–8, 1 immature female.
St. 225–10, 1 adult male.
St. 310, 1 immature female.
St. 312, 1 adult female.
St. 313, 1 adult female.
St. 344, 2 immature females and 2 young forms.
St. 345, 1 adult and 1 immature females.
St. 457, 1 adult female.
St. H6–2, 1 adult female.
St. H10–4, 1 adult male.
St. H45, 1 adult female.
St. H48–2, 2 adult females.
St. H53–1, 1 adult and 1 immature females.
St. H56, 1 immature female.
St. H56–4, 1 immature female.
St. H59, 2 young forms.
St. H62, 1 immature male.

Body length:

Female up to 9.3 mm, male up to 10.8 mm.

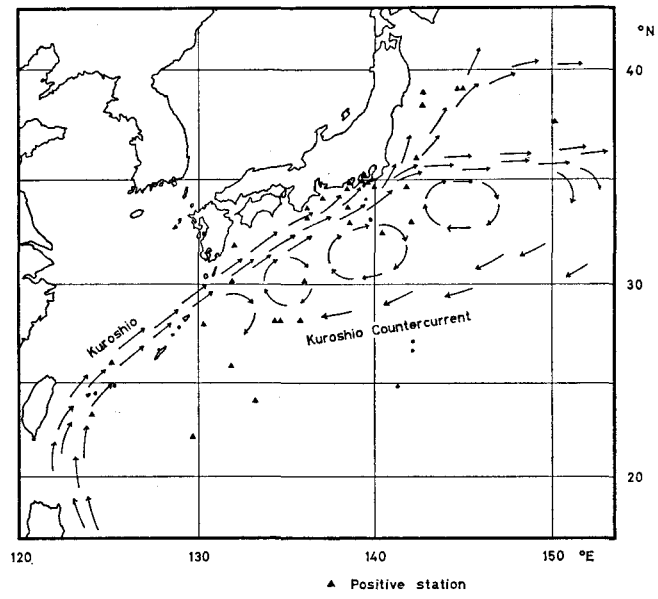

Fig. 9. Geographical distribution of *Katerythrops oceanae* Holt and W. Tattersall in the Pacific Ocean and the current system. (The reference on the latter was made to Kawai, 1972).

Remarks:

The present species is easily distinguished from the other species of mysids by the inflation of carapace, by the small antennal scale and eye, and by the shape and armature of telson.

Geographical distribution:

In the pacific Ocean this species was firstly recorded by Ii from Sagami Bay, Central Japan, in 1964. It became clear through the present collections that the present species is restrictedly distributed in the Pacific Ocean of the neighbouring waters of Japan. This area corresponds to the Kuroshio Current and the Kuroshio Countercurrent regions (Fig. 9). This also corresponds to the sea area in which the values of water temperature and dissolved oxygen contents at the distributional depth are higher than those in the surrounding areas (Fig. 10).

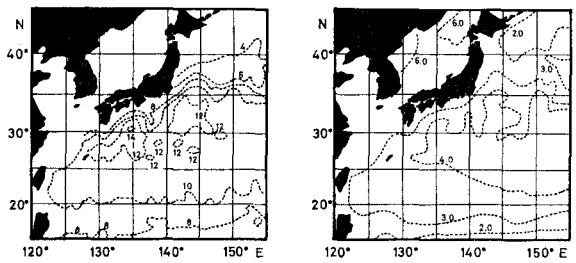

Fig. 10. Water temperature (°C, left) and oxygen contents (ml/l, right) at 500-m layer in the distribution area of *Katerythrops oceanae* Holt and W. Tattersall. (The references on water temperature and oxygen contents were made to Masuzawa, 1972.)

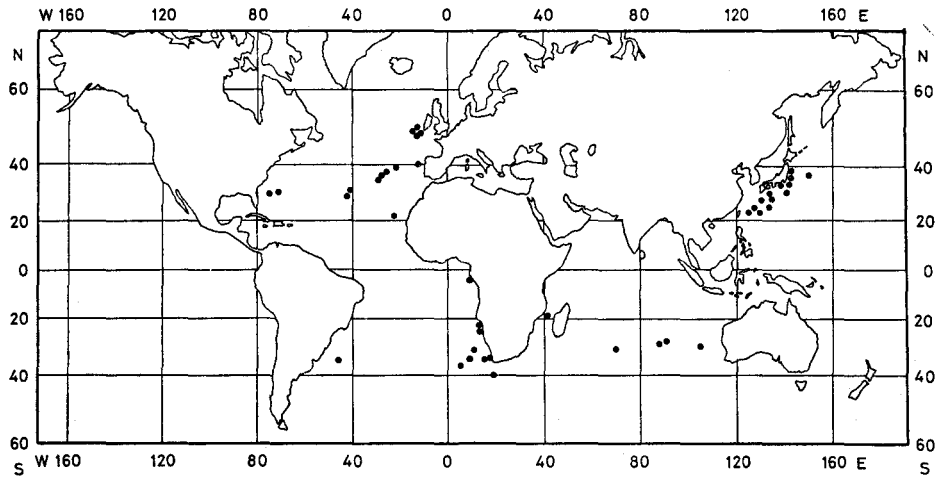

Fig. 11. Geographical distribution of *Katerythrops oceanae* Holt and W. Tattersall in the world. (Some stations in the neighbouring waters of Ireland and Japan were omitted.)

In the Atlantic and the Indian Oceans this species has been recorded from the seas of the temperate zones between about 20 and 40 degrees of both the north and south latitudes, exclusive of the records from Ireland and from the offing of the estuary of River Congo (Fig. 11).

Vertical distribution:

Vertical distribution of this species was studied for the specimens collected

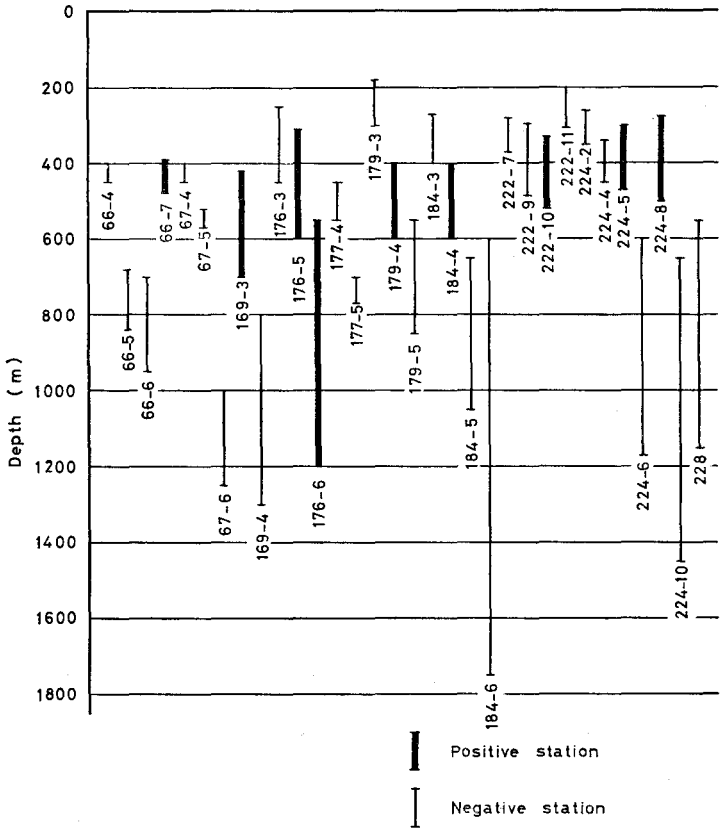

Fig. 12. Depth ranges in 32 horizontal tows by the ORI-net used for the examination of the vertical distribution of *Katerythrops oceanae* Holt and W. Tattersall at night. The numerals show the station number.

from Sagami Bay, Suruga Bay and adjacent waters of these two bays by the ORI-net provided with an opening-closing device. Thirty-two tows were horizontally made in various mid-layers at night, and from 9 tows out of them the species was found (Fig. 12). The profile of the vertical distribution of *Katerythrops oceanae* was obtained by the same method as made for *Teraterythrops robusta* in the preceding paper by the present author. The result was shown in Fig. 13. The vertical range was from the 200-m depth to the 1200-m depth, and a main distribution was found in the layer

from 300 to 700 m deep. The distribution in the layers deeper than 800 m was represented by the result from the collection at St. 176–6 in which the net was horizontally towed in a thick water layer of 550 to 1200 m as if it was a vertical tow. It is quite possible that the specimen in this station was collected from the shallower part, for example from the 550- to 700-m layer. If this assumption should be correct, a result that there are no distribution of this species in the layers deeper than 700 m would be obtained, and this result may be correct.

The average density in the 300- to 700-m layer was 1 individual per 10000 m^3, water temperature in this layer being 8 to 17°C.

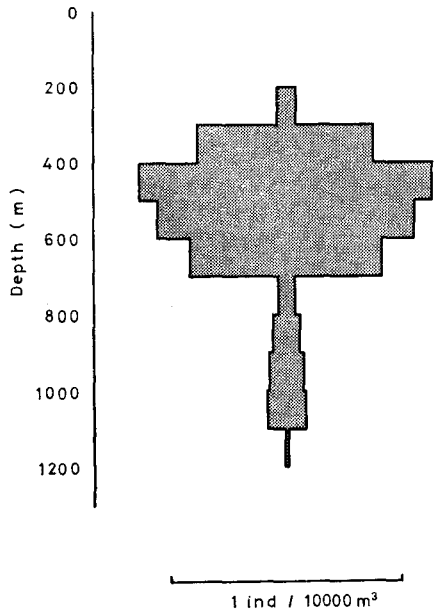

Fig. 13. Vertical distribution of *Katerythrops oceanae* Holt and W. Tattersall at night.

Table 3. Collection data of *Katerythrops oceanae* Holt and W. Tattersall obtained by the ORI-net with an opening-closing device in the daytime.

Station	Depth (m)	Number of individuals collected
60–2	515–585	1
146–3	634–1198	1
178–5	450–570	1
180–4	500–850	1
225–10	520–700	1

In the daytime the vertical distribution profile could not be obtained for the insufficiency of the data. It appears, however, that the species is a bathypelagic form living in the 500- to 700-m layer from the collections by the ORI-net provided with an opening-closing device (Table 3). There is no distinct difference in the vertical distribution between day and night.

The present species has been usually taken solitarily or in a small number, so that it would appear not to live in swarm.

In St. 313 where surface tow was carried out by the ORI-net, one female was taken. This fact is very difficult to be accepted, and some mistakes must have existed through the treatment of the sample, it is supposed.

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Appendix-table 1. Tansei-Maru stations from which the collections reported here were taken.

Station no.	Date	Ship time	Position	Sampling depth (m)	Net and remarks
3–3	Jan. 21, 1964	14: 19–15: 33	From 35°13.8′N, 139°15.5′E to 35°11.8′N, 139°15.5′E	0–500	ORI-net; oblique tow
6–1	Jan. 24, 1964	10: 20–11: 43	From 35°06.1′N, 139°20.4′E to 35°06.1′N, 139°16.5′E	0–470	ORI-net; oblique tow
6–5	Jan. 24, 1964	16: 06–16: 54	From 35°06.0′N, 139°19.0′E to 35°05.5′N, 139°19.4′E	0–720	ORI-net; oblique tow
6–6	Jan. 24, 1964	21: 26–23: 06	From 35°06.0′N, 139°20.4′E to 35°05.8′N, 139°16.0′E	0–405	ORI-net; oblique tow
8	Jan. 26, 1964	11: 03–11: 52	From 34°46.6′N, 139°11.3′E to 34°47.6′N, 139°12.1′E	0–530	ORI-net; oblique tow
14	Jan. 27, 1964	13: 32–14: 20	From 35°06.1′N, 139°30.5′E to 35°05.5′N, 139°32.0′E	0–575	ORI-net; oblique tow
15	Jan. 27, 1964	15: 44–16: 34	From 35°01.9′N, 139°40.3′E to 35°03.2′N, 139°41.8′E	0–510	ORI-net; oblique tow
60–2	May 24, 1964	17: 10–18: 00	From 35°01.4′N, 138°39.2′E to 35°02.5′N, 138°40.2′E	515–585	ORI-net; horizontal tow
66–1	Aug. 13, 1964	16: 30–17: 03	35°00.9′N, 139°13.5′E	0–580	ORI-net; oblique tow
66–7	Aug. 14, 1964	03: 40–04: 40	From 35°02.3′N, 139°22.2′E to 35°00.9′N, 139°21.5′E	390–480	ORI-net; horizontal tow
79	Aug. 19, 1964	19: 32–22: 28	From 34°43.2′N, 139°52.2′E to 34°41.6′N, 139°43.4′E	0–1620	ORI-net; oblique tow
84–3	Oct. 25, 1964	16: 34–17: 45	From 35°06.3′N, 139°17.0′E to 35°04.4′N, 139°17.2′E	0–1000	ORI-net; accidentally touched the sea-floor in oblique tow
94	Oct. 31, 1964	14: 55–16: 03	From 34°30.0′N, 138°29.7′E to 34°27.9′N, 138°29.6′E	0–1020	ORI-net; oblique tow
98	Nov. 1, 1964	07: 44–09: 04	From 33°00.3′N, 138°34.3′E to 33°03.2′N, 138°38.5′E	0–970	ORI-net; oblique tow
104–8	Mar. 1, 1965	20: 12–21: 03	From 34°59.3′N, 139°15.9′E to 35°00.2′N, 139°15.5′E	0–1100	ORI-net; oblique tow

Appendix-table 1. (Cont.)

Station no.	Date	Ship time	Position	Sampling depth (m)	Net and remarks
106–1	Mar. 2, 1965	16: 47–18: 03	From 34°52.7′N, 138°38.1′E to 34°49.7′N, 138°37.5′E	0–950	ORI-net; oblique tow
107	Mar. 4, 1965	11: 33–14: 27	From 34°32.6′N, 138°35.4′E to 34°26.0′N, 138°35.6′E	0–2000	ORI-net; oblique tow
108	Apr. 23, 1965	12: 12–13: 30	From 35°04.9′N, 139°19.6′E to 35°02.1′N, 139°18.9′E	0–1000	ORI-net; oblique tow
109	Apr. 23, 1965	15: 33–16: 57	From 34°54.1′N, 139°14.4′E to 34°56.7′N, 139°18.9′E	0–680	ORI-net; oblique tow
110	Apr. 23, 1965	19: 07–20: 24	From 34°49.9′N, 139°31.6′E to 34°49.6′N, 139°28.8′E	0–1440	ORI-net; oblique tow
111–1	Apr. 24, 1965	14: 40–15: 56	From 34°30.1′N, 138°30.5′E to 34°31.2′N, 138°33.7′E	0–1000	ORI-net; oblique tow
111–2	Apr. 24, 1965	16: 05–18: 59	From 34°31.2′N, 138°33.7′E to 34°23.6′N, 138°34.6′E	0–1430	ORI-net; oblique tow
112	Apr. 24, 1965	22: 24–23: 43	From 34°00.0′N, 138°28.0′E to 33°55.0′N, 138°27.0′E	0–1300	ORI-net; oblique tow
113	Apr. 25, 1965	02: 57–04: 16	From 33°30.9′N, 138°30.1′E to 33°32.2′N, 138°35.4′E	0–520	ORI-net; oblique tow
114	Apr. 25, 1965	07: 43–09: 00	From 33°01.2′N, 138°33.5′E to 33°01.2′N, 138°38.0′E	0–930	ORI-net; oblique tow
117–1	Apr. 26, 1965	04: 18–05: 39	From 32°29.5′N, 140°30.0′E to 32°31.7′N, 140°33.0′E	0–1100	ORI-net; oblique tow
117–2	Apr. 26, 1965	05: 44–08: 42	From 32°31.7′N, 140°33.0′E to 32°37.8′N, 140°41.0′E	0–1560	ORI-net; oblique tow
121–2	Apr. 27, 1965	01: 20–04: 20	From 34°33.3′N, 140°35.0′E to 34°35.0′N, 140°47.0′E	0–1100	ORI-net; oblique tow
132	Apr. 11, 1966	21: 23–22: 25	From 34°32.1′N, 138°43.1′E to 34°32.1′N, 138°39.5′E	0–520	ORI-net; oblique tow

Appendix-table 1. (Cont.)

Station no.	Date	Ship time	Position	Sampling depth (m)	Net and remarks
134	Apr. 12, 1966	19: 00–19: 38	From 33°45.5′N, 136°11.4′E to 33°46.1′N, 136°12.8′E	0–450	ORI-net; oblique tow
138	Apr. 19, 1966	13: 43–14: 55	From 35°00.6′N, 139°15.1′E to 35°02.8′N, 139°15.6′E	0–1000	ORI-net; oblique tow
141–1	June 10, 1966	02: 00–03: 15	From 27°59.2′N, 130°18.5′E to 27°58.2′N, 130°21.3′E	0–908*	ORI-net; oblique tow
144–1	June 11, 1966	20: 10–21: 22	From 28°05.4′N, 134°07.2′E to 28°03.8′N, 134°10.6′E	0–845*	ORI-net; oblique tow
144–2	June 11, 1966	18: 31–19: 47	From 28°06.5′N, 134°02.3′E to 28°05.7′N, 134°06.7′E	0–845*	ORI-net; oblique tow
144–3	June 11–12, '66	21: 29–00: 22	From 28°03.8′N, 134°10.6′E to 28°01.7′N, 134°18.7′E	0–1368*	ORI-net; oblique tow
145–1	June 12, 1966	20: 26–21: 38	From 28°11.5′N, 135°48.0′E to 28°13.8′N, 135°49.3′E	0–684*	ORI-net; oblique tow
145–2	June 12, 1966	18: 46–20: 00	From 28°08.6′N, 135°46.5′E to 28°10.2′N, 135°47.6′E	0–1147*	ORI-net; oblique tow
145–3	June 12, 1966	12: 44–15: 42	From 28°00.0′N, 135°52.5′E to 28°03.8′N, 135°44.3′E	0–1368*	ORI-net; oblique tow
146–3	June 13, 1966	15: 35–17: 43	From 30°04.3′N, 135°50.1′E to 30°07.7′N, 135°50.3′E	634–1198*	ORI-net; horizontal tow
149–2	June 15, 1966	06: 27–07: 48	From 33°13.9′N, 136°05.3′E to 33°13.3′N, 136°09.3′E	0–845*	ORI-net; oblique tow
150	June 15, 1966	22: 14–22: 53	34°03.7′N, 137°01.9′E	0–781*	ORI-net; oblique tow
151	July 14, 1966	12: 50–14: 27	From 34°52.7′N, 138°38.3′E to 34°56.7′N, 138°38.6′E	0–810	ORI-net; oblique tow
154	July 15, 1966	00: 50–02: 39	From 34°53.4′N, 138°38.8′E to 34°57.2′N, 138°40.0′E	0–950	ORI-net; oblique tow
156–1	July 15, 1966	17: 00–18: 46	From 34°32.3′N, 138°35.6′E to 34°35.5′N, 138°36.6′E	0–1000	ORI-net; oblique tow

Appendix-table 1. (Cont.)

Station no.	Date	Ship time	Position	Sampling depth (m)	Net and remarks
157	July 15, 1966	19: 53–21: 38	From 34°25.7′N, 138°37.2′E to 34°23.1′N, 138°34.5′E	0–1000	ORI-net; oblique tow
159	July 15–16, '66	19: 53–21: 38	From 34°22.3′N, 138°30.0′E to 34°24.2′N, 138°32.2′E	0–1300	ORI-net; oblique tow
161	July 16, 1966	03: 14–05: 00	From 34°27.4′N, 138°32.6′E to 34°29.2′N, 138°36.9′E	0–850	ORI-net; oblique tow
169–3	July 17, 1966	21: 48–22: 48	From 34°28.9′N, 138°37.0′E to 34°27.5′N, 138°35.4′E	420–700	ORI-net; horizontal tow
169–4	July 17–18, '66	23: 53–01: 23	From 34°26.8′N, 138°34.6′E to 34°25.8′N, 138°30.7′E	800–1300	ORI-net; horizontal tow
176–4	July 18, 1966	19: 28–20: 28	From 34°49.2′N, 139°30.8′E to 34°49.2′N, 139°31.8′E	0–690	ORI-net; oblique tow
176–5	July 19, 1966	01: 11–02: 11	From 34°47.9′N, 139°30.9′E to 34°49.2′N, 139°32.6′E	310–600	ORI-net; horizontal tow
176–6	July 19, 1966	03: 08–04: 38	From 34°49.5′N, 139°34.4′E to 34°47.4′N, 139°35.9′E	550–1200	ORI-net; horizontal two
177–5	July 19, 1966	19: 28–20: 58	From 34°48.3′N, 139°31.6′E to 34°45.5′N, 139°31.5′E	700–770	ORI-net; horizontal tow
178–5	July 20, 1966	13: 36–14: 36	From 34°45.4′N, 139°32.4′E to 34°45.0′N, 139°33.8′E	450–570	ORI-net; horizontal tow
179–4	July 21, 1966	00: 28–01: 28	From 34°45.1′N, 139°31.4′E to 34°43.6′N, 139°32.8′E	400–600	ORI-net; horizontal tow
180–4	July 21, 1966	12: 25–13: 30	From 34°43.6′N, 139°36.5′E to 34°44.0′N, 139°34.2′E	500–850	ORI-net; horizontal two
184–4	July 23, 1966	21: 33–22: 33	From 34°49.7′N, 139°32.6′E to 34°48.5′N, 139°32.4′E	400–600	ORI-net; horizontal tow
185	July 24, 1966	05: 44–08: 01	From 34°41.0′N, 139°38.8′E to 34°44.2′N, 139°36.5′E	0–2000	ORI-net; oblique tow

Appendix-table 1. (Cont.)

Station no.	Date	Ship time	Position	Sampling depth (m)	Net and remarks
190–3	Sep. 21, 1966	21: 15–22: 00	From 39°03.3′N, 144°16.0′E to 39°02.0′N, 144°16.2′E	500–750	ORI-net; horizontal tow
190–7	Sep. 22, 1966	02: 04–03: 12	From 39°03.5′N, 144°21.4′E to 39°01.5′N, 144°22.5′E	0–1060	ORI-net; oblique tow
191–1	Sep. 22, 1966	18: 29–19: 35	From 38°52.6′N, 142°32.2′E to 38°46.3′N, 142°32.8′E	0–750	ORI-net; oblique tow
193	Sep. 28, 1966	03: 11–04: 21	From 38°27.6′N, 142°33.4′E to 38°24.3′N, 142°35.0′E	0–750	ORI-net; oblique tow
196–2	Oct. 1, 1966	00: 18–02: 47	From 36°06.2′N, 142°20.2′E to 36°03.3′N, 142°15.5′E	0–2100	ORI-net; oblique tow
197–1	Oct. 1, 1966	09: 55–11: 05	From 35°15.8′N, 142°23.2′E to 35°17.2′N, 142°20.3′E	0–750	ORI-net; oblique tow
198–1	Oct. 2, 1966	09: 21–10: 33	From 34°43.7′N, 141°31.1′E to 34°45.2′N, 141°37.1′E	0–700	ORI-net; oblique tow
202	Oct. 18, 1966	14: 49–15: 21	34°44.8′N, 139°08.5′E	0–480	ORI-net; accidentally touched the sea-floor in oblique tow
212	Jan. 19, 1967	07: 59–09: 07	From 34°58.8′N, 139°18.9′E to 34°59.6′N, 139°22.8′E	0–618*	ORI-net; oblique tow
220	Oct. 20, 1967	18: 50–20: 27	From 35°06.5′N, 139°16.7′E to 35°05.4′N, 139°19.6′E	0–660	ORI-net; oblique tow
221–5	Apr. 23, 1967	13: 30–14: 16	Off Tateyama, Chiba Pref.	370–380	Bottom-net
222–10	Apr. 24, 1967	02: 33–03: 30	From 34°44.0′N, 139°59.9′E to 34°43.0′N, 140°00.0′E	330–520	ORI-net; horizontal tow
223–6	Apr. 24, 1967	10: 55–12: 00	From 34°40.5′N, 139°59.3′E to 34°39.8′N, 139°59.0′E	475–725	ORI-net; horizontal tow
224–5	Apr. 24, 1967	21: 30–22: 19	From 34°40.0′N, 139°59.4′E to 34°41.5′N, 139°59.2′E	300–470	ORI-net; horizontal tow
224–8	Apr. 25, 1967	00: 16–01: 19	From 34°40.9′N, 139°59.7′E to 34°41.6′N, 140°00.1′E	275–500	ORI-net; horizontal tow

Appendix-table 1. (Cont.)

Station no.	Date	Ship time	Position	Sampling depth (m)	Net and remarks
225–10	Apr. 25, 1967	15: 45–18: 20	From 34°41.2′N, 139°59.7′E to 34°44.7′N, 140°01.5′E	520–700	ORI-net; horizontal tow
228	Apr. 25–26, '67	23: 15–01: 02	From 34°42.0′N, 140°02.5′E to 34°42.0′N, 140°00.0′E	550–1150	ORI-net; horizontal tow
293–2	Apr. 13, 1968	13: 00–13: 37	From 35°00.3′N, 139°48.4′E to 35°00.0′N, 139°47.6′E	220–330	Bottom-net
293–3	Apr. 13, 1968	14: 05–14: 43	From 35°00.3′N, 139°47.2′E to 35°00.3′N, 139°47.3′E	370–430	Bottom-net
310	Nov. 3, 1968	18: 10–19: 44	From 34°54.1′N, 138°37.4′E to 34°56.9′N, 138°37.5′E	0–1150	ORI-net; oblique tow
312	Nov. 3, 1968	22: 17–23: 46	From 34°53.7′N, 138°38.9′E to 34°56.5′N, 138°39.2′E	0–1200	ORI-net; oblique tow
313	Nov. 3, 1968	22: 18–22: 33	From 34°53.7′N, 138°38.9′E to 34°53.7′N, 138°39.1′E	surface	ORI-net; horizontal tow
341	May 9, 1969	00: 10–01: 05	35°04.4′N, 139°09.9′E	360–460	Bottom-net
344	May 9, 1969	06: 44–07: 51	From 34°58.7′N, 139°22.5′E to 34°57.0′N, 139°21.9′E	0–1200	ORI-net; oblique tow
345	May 9, 1969	14: 45–15: 58	From 34°20.3′N, 138°34.4′E to 34°23.3′N, 138°35.0′E	0–1000	ORI-net; oblique tow
392–1	May 13, 1969	11: 19–11: 44	From 34°54.0′N, 138°27.0′E to 34°54.1′N, 138°26.3′E	72	Bottom-net
440	Apr. 22, 1970	20: 05–20: 38	28°10.5′N, 129°10.0′E	138–141	Bottom-net
457	Oct. 11, 1970	09: 50–11: 05	From 35°00.5′N, 139°21.7′E to 34°59.6′N, 139°20.6′E	0–700	ORI-net; accidentally touched the sea-floor in oblique tow
557–1	Aug. 13, 1971	23: 08–23: 27	From 35°06.2′N, 138°40.0′E to 35°06.3′N, 138°40.6′E	0–280	ORI-net; accidentally touched the sea-floor in oblique tow
636	Nov. 13, 1971	16: 35–16: 58	From 34°45.8′N, 138°20.9′E to 34°45.1′N, 138°20.5′E	105	Bottom-net

Appendix-table 2. Hakuho-Maru stations from which the collections reported here were taken.

Station no.	Date	Ship time	Position	Sampling depth (m)	Net and remarks
H6–2	Sep. 17, 1967	04: 10–05: 14	From 33°09.8′N, 141°51.8′E to 33°12.8′N, 141°51.9′E	0–950	ORI-net; oblique tow
H10–4	Dec. 9, 1967	06: 53–08: 12	From 37°28.2′N, 150°08.1′E to 37°26.2′N, 150°10.0′E	0–1000	ORI-net; oblique tow
H33	May 21, 1968	17: 20–17: 50	From 30°07.8′N, 125°43.2′E to 30°07.5′N, 125°44.0′E	76	Bottom-net
H36	May 22, 1968	05: 18–05: 58	From 28°41.0′N, 126°48.2′E to 28°40.2′N, 126°48.9′E	185	Bottom-net
H45	May 25, 1968	12: 47–13: 47	From 26°00.8′N, 125°09.5′E to 26°00.8′N, 125°13.0′E	0–800	ORI-net; oblique tow
H48–2	May 26, 1968	21: 25–22: 46	From 23°00.8′N, 124°15.6′E to 22°57.6′N, 124°14.6′E	0–850	ORI-net; oblique tow
H53–1	May 28, 1968	21: 22–22: 41	From 22°08.8′N, 129°41.6′E to 22°09.6′N, 129°44.4′E	0–880	ORI-net; oblique tow
H56	May 31, 1968	06: 02–07: 11	From 24°02.8′N, 133°09.0′E to 24°07.3′N, 133°07.0′E	0–800	ORI-net; oblique tow
H56–4	May 31, 1968	22: 20–23: 27	From 26°03.0′N, 131°53.6′E to 26°06.3′N, 131°52.4′E	0–1000*	ORI-net; oblique tow
H59	June 2, 1968	18: 02–19: 06	From 30°12.1′N, 132°03.3′E to 30°15.7′N, 132°04.5′E	0–730	ORI-net; oblique tow
H62	June 5, 1968	22: 40–23: 44	From 31°50.5′N, 132°07.4′E to 31°52.9′N, 132°10.7′E	0–850	ORI-net; oblique tow
H113–4	Sep. 28, 1969	22: 40–23: 10	From 05°02.6′N, 154°50.2′W to 05°03.6′N, 154°49.0′W	610–770	ORI-net; horizontal tow
H113–6	Sep. 29, 1969	00: 01–00: 31	From 05°05.1′N, 154°47.2′W to 05°05.9′N, 154°46.2′W	750–800	ORI-net; horizontal tow
H123–6	Oct. 17, 1969	02: 15–03: 00	From 14°36.1′S, 155°08.8′W to 14°36.8′S, 155°07.0′W	620–870	ORI-net; horizontal tow

Appendix-table 2. (Cont.)

Station no.	Date	Ship time	Position	Sampling depth (m)	Net and remarks
H160–13	May 29, 1971	18: 13–19: 45	From 24°13.9′N, 126°37.7′E to 24°12.8′N, 126°37.4′E	0–1480	ORI-net; oblique tow

Appendix-table 3. Suruga-Maru stations from which the collections reported here were taken.

S1	July 14, 1967	07: 50–08: 20	From 34°55.6′N, 138°30.3′E to 34°55.4′N, 138°29.8′E	80	Plankton net attached to the mouth of a beam trawl
S2	July 14, 1967	13: 15–13: 45	From 34°44.1′N, 138°19.7′E to 34°44.5′N, 138°20.0′E	80	〃
S3	July 14, 1967	15: 20–15: 50	From 34°49.2′N, 138°21.5′E to 34°49.8′N, 138°21.6′E	80	〃

* The depth is estimated from the wire ongle and wire length. In others it is estimated from the TSK Depth-Distance Recorder.

EXPLANATION OF PLATE I

Above: *Pteromysis amemiyai* Ii
Below: *Longithorax fuscus* Hansen

(Photographs were taken in a week after the catch.)

Pteromysis amemiyai Ii

Longithorax fuscus Hansen

(Photographs were taken in a week after the catch.)